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MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2022/2023 (TERM ID 2210)

BFN3094 – RETIREMENT PLANNING

7 February 2023
9.00 a.m – 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of EIGHT (8) printed pages with four (4) questions and 4 financial tables excluding the cover page.
2. Attempt ALL questions.
3. Please write all your answer in the **Answer Booklet** provided.
4. Marks are shown at the end of each question.

There are FOUR (4) questions. Answer ALL.

Question 1 (25 Marks)

Retirement planning is crucial in helping people to save enough to live the lifestyle they want when they retire. According to the RinggitPlus survey on Malaysian Financial Behaviour in year 2021, 51% of respondents indicate that they cannot survive more than three months if they lose their job and conversely 28% can last six months being unemployed. As for millennials between 18 and 35 years old, the responses recorded were worse than the national average. About 24% of them cannot survive beyond a month on savings alone, higher than the 20% of survey average and 57% cannot survive beyond three months on savings.

- (a) Given the above, retirement planning is crucial in helping people to save enough to live the lifestyle they want when they retire. A sound financial planning is necessary in achieving retirement goals. However, your financial needs and goals will change as you move through different stages of your life. Yet certain financial goals are important regardless of age. Draw a diagram to depict the six (6) personal financial planning life cycle.

(7 marks)

- (b) Discuss and explain in details the diagram from part (a) on how the six (6) financial planning components relate to our different life stages. The life stages can range from early childhood, high school, family formation, career development, pre-retirement and retirement period.

(18 marks)

Question 2 (25 Marks)

- (a) Private insurance companies generally insure only pure risks. However, some pure risks are not privately insurable. From the viewpoint of a private insurer, an insurable risk ideally should have certain characteristics. Explain the six characteristics of an insurable risk.

(18 marks)

- (b) A key component of retirement planning is protecting your assets. Insurance serves as an effective risk management tools. There are various types of private insurance available. Suggest which type of insurance that you think is important to be included in the retirement plan, and why.

(7 marks)

Continued...

Question 3 (25 Marks)

KUALA LUMPUR - Malaysians are at their worst financial position in 2022 compared with the last five years, and the looming recession may push them to the brink with dwindling savings coupled with the aftermath of the Covid-19 pandemic.

A recent survey by Malaysian financial services website RinggitPlus revealed that 70 per cent of Malaysians saved less than RM500 per month in 2022 or did not save at all. But what is even more worrying is that some Malaysians cannot guarantee their retirement as about 3.6 million pension fund Employees Provident Fund (EPF) members have less than RM1,000 in their accounts as at November 2021. EPF has a total of 15.21 million members as at December 2021. The survey also showed that 63 per cent of Malaysians can survive only three months or less with the diminished savings, should they lose their jobs.

Source: <https://www.straitstimes.com/asia/se-asia/malaysians-saving-less-most-do-not-have-enough-in-retirement-funds-survey>

- (a) The article above suggested that Malaysians have a poor financial planning attitude (or behaviour). Therefore, there is an urgent need to save and invest enough for retirement. Apart from conventional savings, list and discuss at least 3 types of investment tools which are available for retirement planning.

(9 marks)

- (b) Assume that you have decided to invest and include a large proportion of common stock in your portfolio. Your objective is to build up as much capital as you can over the next 15 to 20 years, and you're willing to tolerate a "good deal" of risk. What types of stocks (blue chips, income stocks, and so on) do you think you'd be most interested in, and why? Select at least three types of stocks and briefly explain the rationale for selecting each.

(12 marks)

- (c) You have just made your first RM5,000 contribution to your individual retirement account. Assuming you earn a 5 percent rate of return and make no additional contributions, what will your account be worth when you retire in 35 years? What if you wait for 5 years before contributing?

(4 marks)

Continued...

Question 4 (25 Marks)

- (a) Table A shows Mr. Mohammad's personal balance sheet as of December 2022.

TABLE A

ASSETS	RM	RM	LIABILITIES & NET WORTH	RM	RM
Cash on hand	70		Utilities	90	
in checking	180		Insurance Premiums	220	
Savings account	650		Taxes	400	
			Bank credit card balances	400	
			Dept. store credit card balances	190	
Total Liquid Assets		900	Total Current Liabilities		1300
INVESTMENTS			LONG TERM LIABILITIES		
Stocks	3000		Primary residence mortgage	52000	
Bonds	500		Auto loans	3000	
			Appliance/ furniture loans	500	
Total Investments		3500	Total Long-Term Liabilities		55500
REAL PROPERTY					
Primary residence	68000				
Total Real Property		68000	TOTAL LIABILITIES		56800
PERSONAL PROPERTY					
Auto(s):	10000				
Household furnishing	1050				
Other	900				
Total Personal Property		11950	Net Worth (TA - TL)		27550
TOTAL ASSETS		84350	TOTAL LIABILITIES & NET WORTH		84350

Continued...

Based on the data given in Table A, evaluate Mr. Mohammad's balance sheet relative to the following factors:

- i. solvency,
- ii. liquidity, and
- iii. equity in his dominant asset.

(18 marks)

- (b) Sharifah is a 28-year old, working mother of one son, who's now employed as a supervisor in a company located at Seremban, Negeri Sembilan. Although she thoroughly enjoys her job and the people she works with, what she would really like to start her own business to generate better income and save up for her retirement. She plans to start her florist business in Port Dickson in about 8 years. After planning and estimation, she will need about RM50,000 in capital to do so.

- i. Assume she can make about 10% on her money, If she's starting from scratch, how much would she have to put away annually to accumulate the needed capital in 8 years?

(5 marks)

- ii. Given that Sharifah has an idea of how much she needs to save, briefly explain how she could use an investment plan to help reach her objective.

(2 marks)

End of Questions

Financial Tables

Table A-1 Future Value Interest Factors for One Dollar Compounded at k Percent for n Periods: $FVIF_{k,n} = (1 + k)^n$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1100	1.1200	1.1300	1.1400	1.1500	1.1600	1.2000	1.2400	1.2500	1.3000
2	1.0201	1.0404	1.0609	1.0816	1.1025	1.1236	1.1449	1.1664	1.1881	1.2100	1.2321	1.2544	1.2769	1.2996	1.3225	1.3456	1.4400	1.4900	1.5625	1.6900
3	1.0303	1.0612	1.0927	1.1249	1.1576	1.1910	1.2250	1.2597	1.2950	1.3310	1.3676	1.4048	1.4428	1.4815	1.5209	1.5609	1.7280	1.9066	1.9931	2.4970
4	1.0406	1.0824	1.1255	1.1699	1.2153	1.2625	1.3108	1.3599	1.4116	1.4641	1.5181	1.5735	1.6303	1.6880	1.7469	1.8066	2.0736	2.3642	2.4414	2.8561
5	1.0510	1.1041	1.1583	1.2137	1.2703	1.3282	1.3873	1.4476	1.5091	1.5718	1.6358	1.7011	1.7678	1.8358	1.9051	1.9756	2.4003	2.8316	3.0518	3.7129
6	1.0615	1.1262	1.1941	1.2633	1.3339	1.4060	1.4796	1.5547	1.6313	1.7094	1.7891	1.8704	1.9534	2.0382	2.1248	2.2132	2.7680	3.3332	3.6147	4.3768
7	1.0721	1.1487	1.2299	1.3133	1.4000	1.4889	1.5799	1.6731	1.7684	1.8658	1.9653	2.0669	2.1706	2.2764	2.3843	2.4943	3.1920	3.8900	4.2077	5.1749
8	1.0829	1.1717	1.2688	1.3686	1.4720	1.5799	1.6913	1.8063	1.9249	2.0471	2.1729	2.3023	2.4354	2.5722	2.7126	2.8566	3.7040	4.5400	4.9005	6.0573
9	1.0937	1.1951	1.3048	1.4233	1.5513	1.6895	1.8379	1.9964	2.1650	2.3437	2.5325	2.7314	2.9404	3.1595	3.3888	3.6282	4.6400	5.6200	6.0300	7.5000
10	1.1046	1.2190	1.3439	1.4802	1.6289	1.7908	1.9672	2.1593	2.3674	2.5917	2.8323	3.0894	3.3629	3.6529	3.9594	4.2824	5.4000	6.5000	6.9500	8.7000
11	1.1157	1.2434	1.3842	1.5395	1.7009	1.8793	2.0759	2.2908	2.5243	2.7764	3.0471	3.3364	3.6444	3.9711	4.3164	4.6804	5.8000	7.0000	7.4500	9.3000
12	1.1268	1.2682	1.4258	1.6010	1.7899	2.0022	2.2522	2.5408	2.8583	3.1948	3.5503	3.9248	4.3183	4.7308	5.1623	5.6128	6.8000	8.1000	8.5500	10.6000
13	1.1381	1.2936	1.4685	1.6651	1.8656	2.0929	2.3688	2.6938	3.0583	3.4523	3.8758	4.3283	4.8098	5.3203	5.8608	6.4323	7.7000	9.1000	9.5500	11.8000
14	1.1495	1.3195	1.5126	1.7347	1.9799	2.2808	2.6785	3.1372	3.6417	4.1944	4.7964	5.4483	6.1513	6.9153	7.7403	8.6273	10.0000	11.5000	11.9500	14.4000
15	1.1610	1.3439	1.5580	1.8009	2.0789	2.3966	2.7990	3.2772	3.8225	4.4372	5.1218	5.8663	6.6713	7.5373	8.4643	9.4523	10.9000	12.5000	12.9500	15.6000
16	1.1726	1.3728	1.6047	1.8730	2.1929	2.5404	2.9522	3.4259	3.9703	4.5950	5.3009	6.1004	7.0023	7.9153	8.9393	10.0843	11.6000	13.3000	13.7500	16.6000
17	1.1843	1.4002	1.6528	1.9479	2.2920	2.6828	3.1588	3.7000	4.3276	5.0445	5.8591	6.7660	7.7763	8.8893	10.1143	11.4593	13.1000	14.9000	15.3500	18.4000
18	1.1961	1.4282	1.7024	2.0258	2.4066	2.8543	3.3798	3.9980	4.7171	5.5399	6.4646	7.5000	8.6463	9.8933	11.3403	12.8953	14.7000	16.6000	17.0500	20.2000
19	1.2081	1.4568	1.7535	2.1068	2.5270	3.0256	3.6165	4.3457	5.1417	6.1159	7.2833	8.6128	10.197	12.036	14.232	16.777	18.7000	20.7000	21.1500	24.4000
20	1.2202	1.4859	1.8061	2.1911	2.6533	3.2071	3.8897	4.6610	5.6044	6.7275	8.0623	9.6463	11.523	13.743	16.367	19.461	21.4000	23.4000	23.8500	27.2000
21	1.2324	1.5157	1.8603	2.2788	2.7860	3.3996	4.1406	5.0338	6.1088	7.4002	8.9482	10.804	12.921	15.568	18.832	22.574	24.6000	26.6000	27.0500	30.6000
22	1.2447	1.5460	1.9161	2.3699	2.9253	3.6035	4.4304	5.4355	6.6586	8.1403	9.9336	12.100	14.714	17.861	21.645	26.186	26.8000	28.8000	29.2500	33.8000
23	1.2572	1.5769	1.9738	2.4647	3.0715	3.8197	4.7405	5.8715	7.2579	8.9549	11.026	13.552	16.627	20.362	24.891	30.376	27.5000	30.0000	30.5500	36.2000
24	1.2697	1.6084	2.0328	2.5633	3.2251	4.0489	5.0724	6.3412	7.9111	9.8497	12.239	15.179	18.788	23.212	28.625	35.236	28.2000	31.2000	31.0500	38.6000
25	1.2824	1.6406	2.0938	2.6658	3.3864	4.2919	5.4274	6.6485	8.6231	10.835	13.565	17.000	21.231	26.462	32.919	40.874	28.9000	32.4000	32.1000	41.0000
30	1.3478	1.8114	2.4273	3.2434	4.3219	5.7435	7.6123	10.063	13.268	17.449	22.892	29.960	39.116	50.950	66.212	85.850	29.7000	33.6000	34.1500	43.4000
35	1.4166	1.9989	2.8139	3.9461	5.5160	7.6861	10.677	14.765	20.414	28.102	38.575	52.800	72.069	98.400	133.176	180.314	30.5000	34.8000	35.4000	45.8000
40	1.4908	2.0389	2.8983	4.1039	5.7918	8.1473	11.424	15.988	22.251	30.913	42.818	59.136	81.437	111.834	153.152	209.184	31.2000	35.0000	35.6000	48.2000
45	1.4889	2.2680	3.9520	4.8010	7.0400	10.286	14.974	21.775	31.408	45.259	65.061	93.051	132.782	188.884	267.864	378.721	31.8000	35.2000	35.8000	50.6000
50	1.5446	2.6916	4.9839	7.1067	11.457	18.420	29.457	46.902	74.358	117.391	184.569	289.062	450.735	708.233	1,061.233	1,561.233	32.4000	35.4000	36.0000	53.0000

Continued...

Table A-2. Future Value Interest Factors for a One-Dollar Annuity Compounded at k Percent for n Periods: $FVIFA_{k,n} = [(1+k)^n - 1]/k$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	28%	30%
1	1.0000	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1100	1.1200	1.1300	1.1400	1.1500	1.1600	1.2000	1.2400	1.2800	1.3000
2	2.0100	2.0400	2.0600	2.0800	2.0900	2.1000	2.1100	2.1200	2.1300	2.1400	2.1500	2.1600	2.1700	2.1800	2.1900	2.2000	2.2400	2.2800	2.3200	2.3400
3	3.0301	3.0604	3.0909	3.1216	3.1525	3.1836	3.2149	3.2464	3.2781	3.3100	3.3421	3.3744	3.4069	3.4396	3.4725	3.5056	3.5480	3.5908	3.6339	3.6772
4	4.0604	4.1216	4.1836	4.2465	4.3101	4.3746	4.4399	4.5061	4.5731	4.6410	4.7097	4.7793	4.8498	4.9211	4.9934	5.0665	5.1404	5.2151	5.2906	5.3672
5	5.1010	5.2040	5.3091	5.4163	5.5256	5.6371	5.7507	5.8666	5.9847	6.1051	6.2278	6.3528	6.4803	6.6101	6.7424	6.8771	7.0141	7.1534	7.2950	7.4389
6	6.1520	6.3081	6.4684	6.6330	6.8019	6.9753	7.1533	7.3359	7.5233	7.7156	7.9129	8.1152	8.3227	8.5355	8.7537	8.9775	9.2069	9.4418	9.6822	9.9281
7	7.2135	7.4343	7.6595	7.8893	8.1236	8.3626	8.6064	8.8552	9.1091	9.3681	9.6323	9.9017	10.1764	10.4564	10.7418	11.0327	11.3291	11.6310	11.9384	12.2513
8	8.2857	8.5830	8.8923	9.2142	9.5491	9.8975	10.2598	10.6361	11.0174	11.4037	11.7951	12.1916	12.5933	12.9999	13.4116	13.8284	14.2503	14.6773	15.1094	15.5465
9	9.3695	9.7546	10.1590	10.5833	11.0277	11.4921	11.9765	12.4810	12.9966	13.5233	14.0611	14.6100	15.1700	15.7419	16.3258	16.9217	17.5296	18.1494	18.7811	19.4247
10	10.462	10.950	11.464	12.006	12.578	13.181	13.816	14.487	15.193	15.937	16.722	17.549	18.420	19.337	20.304	21.321	22.390	23.513	24.691	25.924
11	11.567	12.189	12.808	13.466	14.170	14.921	15.720	16.569	17.469	18.421	19.427	20.489	21.608	22.786	24.025	25.327	26.694	28.128	29.630	31.199
12	12.683	13.412	14.192	15.026	15.917	16.870	17.888	18.977	20.141	21.384	22.713	24.133	25.650	27.271	28.999	30.838	32.791	34.860	37.047	39.362
13	13.809	14.680	15.618	16.627	17.713	18.882	20.141	21.495	22.953	24.523	26.212	28.029	29.985	32.089	34.352	36.786	39.401	42.198	45.179	48.345
14	14.947	15.974	17.085	18.292	19.599	21.015	22.550	24.215	26.019	27.975	30.095	32.383	34.853	37.511	40.360	43.414	46.677	50.153	53.854	57.791
15	16.097	17.283	18.599	20.024	21.578	23.276	25.129	27.152	29.361	31.772	34.405	37.280	40.417	43.842	47.580	51.660	56.111	60.954	66.101	71.562
16	17.258	18.639	20.157	21.825	23.657	25.673	27.898	30.324	33.003	35.950	39.190	42.753	46.672	50.980	55.717	60.825	66.337	72.281	78.588	85.277
17	18.430	20.012	21.762	23.698	25.840	28.213	30.840	33.750	36.974	40.545	44.501	48.884	53.739	59.018	64.785	71.000	77.715	84.881	92.448	100.447
18	19.615	21.412	23.444	25.645	28.132	30.906	33.999	37.450	41.301	45.599	50.396	55.750	61.725	68.394	75.836	84.141	92.471	100.894	109.366	117.926
19	20.811	22.841	25.117	27.671	30.539	33.760	37.379	41.446	46.018	51.159	56.939	63.440	70.749	78.969	88.212	98.603	109.294	120.354	131.844	143.814
20	22.019	24.297	26.870	29.778	33.066	36.786	40.995	45.762	51.160	57.275	64.203	72.052	80.847	91.075	102.444	115.300	128.868	143.301	158.668	175.045
21	23.239	25.783	28.576	31.869	35.749	39.993	44.865	50.423	56.765	64.002	72.265	81.699	92.470	104.768	118.840	134.841	152.026	170.565	190.636	212.315
22	24.472	27.289	30.537	34.248	38.505	43.392	49.006	55.457	62.873	71.403	81.214	92.503	105.491	120.436	137.692	157.415	177.031	198.658	222.461	248.511
23	25.716	28.845	32.453	36.618	41.430	46.996	53.496	60.893	69.332	79.543	91.448	104.903	120.205	138.297	159.276	183.601	209.637	238.630	270.826	306.345
24	26.973	30.422	34.426	39.063	44.502	50.816	58.177	66.765	76.790	88.497	102.174	118.155	136.631	158.659	184.168	213.978	247.484	285.461	328.033	375.445
25	28.243	32.030	36.459	41.646	47.727	54.865	63.249	73.106	84.701	98.347	114.413	133.334	155.620	181.871	212.793	249.312	291.981	341.301	398.692	465.445
26	29.527	33.680	38.644	44.046	50.511	58.399	67.894	78.941	91.891	107.397	125.811	146.781	171.865	201.341	236.971	280.491	333.651	396.111	468.611	551.811
27	30.825	35.379	40.644	46.446	53.406	61.999	72.594	84.841	99.091	116.697	137.911	161.481	190.165	223.841	263.111	312.111	372.411	444.411	528.411	634.411
28	32.137	37.128	42.644	48.846	56.306	65.599	77.194	89.941	105.291	124.697	148.411	174.481	205.865	243.841	290.111	348.411	420.411	504.411	600.411	710.411
29	33.461	38.927	44.644	51.246	59.206	69.199	81.794	95.941	112.691	133.697	161.411	190.165	223.841	263.111	312.111	372.411	444.411	528.411	624.411	744.411
30	34.795	40.776	46.644	53.646	62.106	72.199	85.794	100.941	119.291	141.697	172.411	203.865	243.841	290.111	348.411	420.411	504.411	600.411	710.411	834.411
35	41.660	48.984	55.462	63.852	73.320	84.835	98.594	114.791	134.291	158.497	188.411	220.165	263.841	312.111	372.411	444.411	528.411	624.411	744.411	884.411
36	43.077	51.994	58.776	67.552	77.520	89.635	104.791	123.291	145.291	172.497	205.865	243.841	290.111	348.411	420.411	504.411	600.411	710.411	834.411	984.411
40	48.886	60.402	75.401	95.026	120.800	154.762	199.535	259.057	337.882	442.593	588.896	787.091	1,058.896	1,424.896	1,904.896	2,534.896	3,374.896	4,504.896	6,004.896	8,004.896
50	64.463	84.579	112.797	152.667	209.348	290.336	406.529	573.770	815.064	1,124.064	1,554.064	2,154.064	2,984.064	4,124.064	5,654.064	7,754.064	10,654.064	14,654.064	20,054.064	27,454.064

Continued...

Table A-3 Present Value Interest Factors for One Dollar Discounted at k Percent for n Periods: $PVIF_{k,n} = 1/(1+k)^n$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.7822
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561	0.7432	0.6944	0.6504	0.6097
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7312	0.7118	0.6931	0.6750	0.6575	0.6407	0.5787	0.5345	0.4932
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718	0.5523	0.4823	0.4380	0.3961
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972	0.4761	0.4019	0.3411	0.2927
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5346	0.5066	0.4803	0.4556	0.4323	0.4104	0.3349	0.2751	0.2307
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759	0.3538	0.2771	0.2218	0.1814
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4038	0.3762	0.3506	0.3269	0.3050	0.2286	0.1789	0.1426
9	0.9143	0.8388	0.7684	0.7046	0.6466	0.5919	0.5409	0.5002	0.4614	0.4241	0.3899	0.3582	0.3296	0.3035	0.2798	0.2580	0.1815	0.1364	0.1043
10	0.9053	0.8203	0.7444	0.6756	0.6139	0.5584	0.5063	0.4652	0.4254	0.3875	0.3522	0.3220	0.2946	0.2697	0.2472	0.2267	0.1515	0.1114	0.0825
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149	0.1954	0.1202	0.0859	0.0616
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4940	0.4400	0.3917	0.3455	0.3118	0.2818	0.2567	0.2337	0.2131	0.1952	0.1785	0.1032	0.0757	0.0549
13	0.8787	0.7730	0.6810	0.6005	0.5283	0.4618	0.4050	0.3617	0.3222	0.2887	0.2595	0.2362	0.2157	0.1976	0.1819	0.1665	0.0912	0.0687	0.0509
14	0.8700	0.7579	0.6611	0.5755	0.5001	0.4300	0.3698	0.3305	0.2957	0.2633	0.2350	0.2130	0.1941	0.1771	0.1625	0.1475	0.0822	0.0625	0.0478
15	0.8613	0.7430	0.6419	0.5523	0.4810	0.4173	0.3624	0.3192	0.2815	0.2504	0.2230	0.2017	0.1833	0.1676	0.1539	0.1392	0.0738	0.0562	0.0436
16	0.8528	0.7284	0.6232	0.5308	0.4551	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1681	0.1515	0.1376	0.1251	0.1122	0.0651	0.0495	0.0389
17	0.8444	0.7142	0.6050	0.5100	0.4393	0.3744	0.3185	0.2703	0.2311	0.1978	0.1696	0.1506	0.1356	0.1231	0.1116	0.0992	0.0541	0.0405	0.0319
18	0.8360	0.7002	0.5874	0.4900	0.4155	0.3503	0.2939	0.2502	0.2120	0.1793	0.1528	0.1340	0.1198	0.1094	0.0999	0.0871	0.0436	0.0320	0.0254
19	0.8277	0.6864	0.5703	0.4706	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1196	0.1061	0.0973	0.0893	0.0779	0.0352	0.0268	0.0216
20	0.8195	0.6730	0.5537	0.4508	0.3759	0.3118	0.2584	0.2145	0.1784	0.1486	0.1240	0.1077	0.0958	0.0878	0.0811	0.0704	0.0287	0.0215	0.0168
21	0.8114	0.6598	0.5375	0.4308	0.3559	0.2912	0.2382	0.1945	0.1607	0.1321	0.1117	0.0966	0.0868	0.0800	0.0743	0.0645	0.0238	0.0175	0.0134
22	0.8034	0.6468	0.5219	0.4220	0.3448	0.2795	0.2275	0.1839	0.1502	0.1228	0.1007	0.0862	0.0780	0.0729	0.0682	0.0593	0.0196	0.0143	0.0106
23	0.7954	0.6342	0.5067	0.4057	0.3256	0.2608	0.2109	0.1673	0.1337	0.1073	0.0897	0.0768	0.0701	0.0656	0.0616	0.0535	0.0170	0.0127	0.0094
24	0.7876	0.6217	0.4919	0.3901	0.3101	0.2440	0.1914	0.1507	0.1264	0.1015	0.0817	0.0694	0.0632	0.0594	0.0559	0.0485	0.0153	0.0110	0.0080
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1216	0.0973	0.0736	0.0618	0.0561	0.0528	0.0498	0.0431	0.0130	0.0097	0.0070
30	0.7419	0.5321	0.4120	0.3083	0.2314	0.1741	0.1314	0.0984	0.0754	0.0573	0.0437	0.0334	0.0256	0.0196	0.0151	0.0116	0.0042	0.0016	0.0012
35	0.7039	0.5000	0.3554	0.2534	0.1813	0.1301	0.0937	0.0676	0.0490	0.0356	0.0259	0.0189	0.0139	0.0102	0.0075	0.0055	0.0017	0.0005	0.0003
40	0.6577	0.4529	0.3069	0.2083	0.1420	0.0972	0.0668	0.0460	0.0318	0.0221	0.0154	0.0107	0.0075	0.0053	0.0037	0.0026	0.0007	0.0002	0.0001
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213	0.0134	0.0085	0.0054	0.0035	0.0022	0.0014	0.0009	0.0006	0.0001	0.0000	0.0000

Continued...

Table A-4. Present Value Interest Factors for a One-Dollar Annuity Discounted at k Percent for n Periods: $PVIFA = [1 - 1/(1 + k)^n] / k$.

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9344	0.9254	0.9174	0.9091	0.9008	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8005	0.8000	0.7692
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6257	1.6052	1.5278	1.4368	1.4400	1.3609
3	2.9410	2.8859	2.8286	2.7731	2.7232	2.6730	2.6243	2.5771	2.5313	2.4868	2.4437	2.4018	2.3612	2.3216	2.2832	2.2459	2.1065	1.9613	1.9520	1.8161
4	3.9020	3.8077	3.7171	3.6289	3.5460	3.4651	3.3872	3.3121	3.2397	3.1698	3.1024	3.0373	2.9745	2.9137	2.8550	2.7982	2.5987	2.4043	2.3616	2.1682
5	4.8534	4.7155	4.5791	4.4518	4.3285	4.2124	4.1002	3.9927	3.8887	3.7908	3.6959	3.6048	3.5172	3.4331	3.3522	3.2743	2.9906	2.7454	2.6893	2.4356
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.2305	4.1114	3.9975	3.8887	3.7845	3.6847	3.3255	3.0205	2.9514	2.6427
7	6.7282	6.4720	6.2303	6.0021	5.7854	5.5821	5.3834	5.2004	5.0330	4.8814	4.7342	4.5918	4.4546	4.3223	4.1950	4.0726	3.6516	3.2423	3.1611	2.8021
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7466	5.5348	5.3349	5.1461	4.9676	4.7983	4.6389	4.4873	4.3436	3.8372	3.4212	3.3289	2.9247
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590	5.5370	5.3282	5.1317	4.9464	4.7716	4.6085	4.0010	3.5855	3.4634	3.0190
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446	5.8892	5.6502	5.4262	5.2161	5.0186	4.8332	4.1925	3.6819	3.5705	3.0915
11	10.368	9.7868	9.2526	8.7605	8.3054	7.8869	7.4987	7.1430	6.8052	6.4951	6.2065	5.9377	5.6869	5.4527	5.2337	5.0286	4.3271	3.7757	3.6564	3.1473
12	11.255	10.575	9.950	9.3651	8.8633	8.3938	7.9527	7.5361	7.1387	6.7647	6.4224	6.1044	5.8096	5.5363	5.2826	5.0426	4.2892	3.6814	3.5551	3.1903
13	12.134	11.348	10.635	9.9856	9.3836	8.8527	8.3577	7.8938	7.4659	7.0649	6.6883	6.3362	6.0078	5.7024	5.4253	5.1716	4.3827	3.7124	3.5801	3.2233
14	13.004	12.106	11.298	10.563	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667	6.9819	6.6282	6.3025	6.0021	5.7245	5.4675	4.6106	3.9616	3.8241	3.2487
15	13.865	12.849	11.938	11.118	10.380	9.7122	9.1079	8.5595	8.0507	7.6061	7.1909	6.8109	6.4624	6.1422	5.8474	5.5745	4.6755	4.0013	3.8593	3.2602
16	14.718	13.578	12.561	11.652	10.838	10.106	9.4466	8.8544	8.3126	7.8237	7.3732	6.9740	6.6039	6.2651	5.9542	5.6685	4.7296	4.0333	3.8874	3.2832
17	15.562	14.292	13.166	12.166	11.274	10.477	9.7632	9.1216	8.5436	8.0216	7.5488	7.1196	6.7281	6.3729	6.0472	5.7487	4.7746	4.0591	3.9099	3.2948
18	16.398	14.992	13.754	12.653	11.690	10.828	10.069	9.3749	8.7556	8.2014	7.7018	7.2497	6.8399	6.4674	6.1280	5.8178	4.8122	4.0789	3.9279	3.3037
19	17.226	15.678	14.324	13.134	12.085	11.158	10.335	9.6036	8.9501	8.3649	7.8393	7.3658	6.9380	6.5504	6.1982	5.8775	4.8435	4.0967	3.9424	3.3105
20	18.046	16.351	14.877	13.590	12.462	11.470	10.594	9.8161	9.1285	8.5136	7.9633	7.4634	7.0248	6.6231	6.2583	5.9289	4.8696	4.1103	3.9539	3.3158
21	18.857	17.011	15.415	14.029	12.821	11.764	10.836	10.017	9.2822	8.6487	8.0751	7.5620	7.1016	6.6970	6.3123	5.9731	4.8913	4.1212	3.9631	3.3198
22	19.660	17.658	15.937	14.451	13.163	12.042	11.061	10.201	9.4424	8.7715	8.1757	7.6446	7.1655	6.7429	6.3587	6.0113	4.9094	4.1300	3.9705	3.3230
23	20.456	18.292	16.444	14.857	13.489	12.303	11.272	10.371	9.5802	8.8832	8.2684	7.7184	7.2297	6.7921	6.3988	6.0442	4.9245	4.1370	3.9764	3.3254
24	21.243	18.914	16.936	15.247	13.799	12.550	11.469	10.529	9.7066	8.9847	8.3401	7.7843	7.2829	6.8351	6.4338	6.0736	4.9371	4.1478	3.9811	3.3272
25	22.023	19.523	17.413	15.622	14.064	12.783	11.654	10.675	9.8226	9.0770	8.4217	7.8431	7.3300	6.8729	6.4641	6.0974	4.9476	4.1474	3.9849	3.3286
26	22.797	20.121	17.882	16.000	14.372	13.000	11.833	10.844	10.000	9.2222	8.5455	7.9444	7.4111	6.9333	6.5000	6.1000	4.9555	4.1474	3.9849	3.3286
27	23.566	20.709	18.341	16.372	14.678	13.200	12.000	11.000	10.167	9.3333	8.6667	8.0000	7.4074	6.8889	6.4444	6.0370	4.9555	4.1474	3.9849	3.3286
28	24.330	21.287	18.791	16.739	14.983	13.391	12.188	11.188	10.333	9.5000	8.8333	8.1667	7.5556	7.0556	6.6000	6.1818	4.9555	4.1474	3.9849	3.3286
29	25.089	21.856	19.232	17.101	15.287	13.574	12.370	11.370	10.500	9.6667	9.0000	8.3333	7.7222	7.2222	6.7500	6.3333	4.9555	4.1474	3.9849	3.3286
30	25.843	22.416	19.665	17.458	15.581	13.758	12.552	11.552	10.667	9.8333	9.1667	8.5000	7.9000	7.4000	6.9259	6.5000	4.9555	4.1474	3.9849	3.3286
31	26.592	22.967	20.085	17.810	15.874	13.941	12.733	11.733	10.833	10.000	9.3333	8.6667	8.0556	7.5556	7.0556	6.6667	4.9555	4.1474	3.9849	3.3286
32	27.336	23.509	20.496	18.157	16.166	14.123	12.908	11.908	11.000	10.167	9.5000	8.8333	8.2222	7.7222	7.2222	6.8519	4.9555	4.1474	3.9849	3.3286
33	28.075	24.043	20.898	18.500	16.457	14.304	13.082	12.082	11.167	10.333	9.6667	9.0000	8.4000	7.9000	7.4000	6.9259	4.9555	4.1474	3.9849	3.3286
34	28.809	24.569	21.291	18.839	16.742	14.484	13.261	12.261	11.333	10.500	9.8333	9.1667	8.5778	8.0556	7.5556	7.0556	4.9555	4.1474	3.9849	3.3286
35	29.538	25.087	21.676	19.174	17.027	14.663	13.440	12.440	11.500	10.667	10.000	9.3333	8.7500	8.2222	7.7222	7.2222	4.9555	4.1474	3.9849	3.3286
36	30.262	25.598	22.053	19.504	17.309	14.841	13.618	12.618	11.667	10.833	10.167	9.5000	8.9259	8.4000	7.9000	7.4000	4.9555	4.1474	3.9849	3.3286
37	30.981	26.102	22.422	19.829	17.589	15.019	13.795	12.795	11.833	11.000	10.333	9.6667	9.1000	8.5778	8.0556	7.5556	4.9555	4.1474	3.9849	3.3286
38	31.695	26.600	22.783	20.149	17.868	15.196	13.971	12.971	12.000	11.167	10.500	9.8333	9.2778	8.7500	8.2222	7.7222	4.9555	4.1474	3.9849	3.3286
39	32.404	27.092	23.137	20.465	18.145	15.372	14.146	13.146	12.167	11.333	10.667	10.000	9.4444	8.9259	8.4000	7.9000	4.9555	4.1474	3.9849	3.3286
40	33.108	27.578	23.484	20.777	18.420	15.547	14.320	13.320	12.333	11.500	10.833	10.167	9.6111	9.0926	8.5778	8.0556	4.9555	4.1474	3.9849	3.3286
41	33.807	28.059	23.824	21.083	18.693	15.721	14.493	13.493	12.500	11.667	11.000	10.333	9.7778	9.2667	8.7500	8.2222	4.9555	4.1474	3.9849	3.3286
42	34.501	28.534	24.157	21.385	18.964	15.894	14.665	13.665	12.667	11.833	11.167	10.500	9.9444	9.4259	8.9259	8.4000	4.9555	4.1474	3.9849	3.3286
43	35.191	29.004	24.483	21.682	19.234	16.066	14.837	13.837	12.833	12.000	11.333	10.667	10.1111	9.5833	9.0926	8.5778	4.9555	4.1474	3.9849	3.3286
44	35.876	29.469	24.802	21.975	19.502	16.237	15.008	14.008	13.000	12.167	11.500	10.833	10.2778	9.7500	9.2667	8.7500	4.9555	4.1474	3.9849	3.3286
45	36.557	29.929	25.114	22.264	19.769	16.408	15.178	14.178	13.167	12.333	11.667	11.000	10.4444	9.9167	9.4259	8.9259	4.9555	4.1474	3.9849	3.3286
46	37.233	30.384	25.419	22.549	20.034	16.578	15.347	14.347	13.333	12.500	11.833	11.167	10.6111	10.0833	9.5833	9.0926	4.9555	4.1474	3.9849	3.3286
47	37.905	30.834	25.717	22.829	20.298	16.747	15.515	14.515	13.500	12.667	12.000	11.333	10.7778	10.2500	9.7500	9.2667	4.9555	4.1474	3.9849	3.3286
48	38.573	31.279	26.009	23.105	20.561	16.915	15.683	14.683	13.667	12.833	12.167	11.500	10.9444	10.4167	9.9167	9.4259	4.9555	4.1474	3.9849	3.3286
49	39.237	31.719	26.294	23.377	20.823	17.083	15.850	14.850	13.833	13.000	12.333	11.667	11.1111	10.5833	10.0833	9.5833	4.9555	4.1474	3.9849	3.3286
50	39.897	32.155	26.572	23.645	21.084	17.250	16.017	15.017	14.000	13.167	12.500	11.833	11.2778	10.7500	10.2500	9.7500	4.9555	4.1474	3.9849	3.3286

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